WHAT IS CLAIMED IS:

1. A signal evaluation method configured to evaluate a reproduction equalization signal reproduced from a recording medium by use of a PRML (partial response and maximum likelihood) discrimination method, said method comprising the steps of:

detecting matching between discrimination data and a plurality of predetermined bit sequence pairs of different groups;

calculating a bit sequence and corresponding two ideal responses when the matching is detected;

obtaining Euclidean distances between the two ideal responses and equalization signals;

obtaining a difference between the Euclidean distances;

obtaining a mean value and a standard deviation with respect to the difference between the Euclidean distances; and

calculating a quality evaluation value of a reproduction signal based on the mean value, the standard deviation, an appearance probability of the predetermined bit sequence, and a Hamming distance between the predetermined bit sequence pairs.

2. A signal evaluation method according to claim 1, wherein said quality evaluation signal is used as a first evaluation value, a target signal is calculated based on a predetermined data sequence and

a predetermined partial response characteristic, an equalization error representing a difference in reproduction equalization signals is calculated in each clock period, a second evaluation value based on the autocorrelation of said equalization error is used as an evaluation value for evaluating the signal quality, and said first evaluation value and said second evaluation value are used in combination to obtain final evaluation.

3. A signal evaluation method according to claim 2, wherein the final evaluation is made based on the first evaluation value, the second evaluation value, and a third evaluation value, the third evaluation value being provided by an error correction decoder and attributable mainly to a medium defect.

4. A signal evaluation method according to claim 1, wherein said quality evaluation value is used as a first evaluation value, and the final evaluation is made based on the first evaluation value and a third evaluation value, the third evaluation value being provided by an error correction decoder and attributable mainly to a medium defect.

5. A signal evaluation method according to any one of claims 1, 2, 3 and 4, wherein the evaluation value is calculated by use of equalization signals corresponding to 100,000 channel bits or more.

6. An apparatus used as one of an information

recording/reproducing apparatus and an information reproducing apparatus and outputting reproduction signals reproduced from a recording medium by use of a PRML (partial response and maximum likelihood) discrimination method, said apparatus comprising signal reproduction evaluation means including:

means for detecting matching between discrimination data and a plurality of predetermined bit sequence pairs of different groups;

means for calculating a bit sequence and corresponding two ideal responses when the matching is detected;

means for obtaining Euclidean distances between the two ideal responses and equalization signals;

means for obtaining a difference between the Euclidean distances;

means for obtaining a mean value and a standard deviation with respect to the difference between the Euclidean distances; and

means for calculating a quality evaluation value of a reproduction signal based on the mean value, the standard deviation, an appearance probability of the predetermined bit sequence, and a Hamming distance between the predetermined bit sequence pairs.

7. An apparatus according to claim 6, further comprising:

means for adjusting a recording waveform by use of

a value calculated based on the mean value and the standard deviation.

8. An apparatus used as one of an information recording/reproducing apparatus and an information reproducing apparatus and configured to produce an evaluation value by use of a signal evaluation method described in any one of claims 1, 2, 3, and 4, said apparatus comprising means for performing at least one of: adjustment of a recording waveform; an offset adjustment of a reproduction signal; gain adjustment; adjustment of an equalization coefficient; tracking control; focusing control; tilting control; and the adjustment of a spherical aberration.

9. An apparatus according to any one of claims 5, 6 and 7, wherein the evaluation value is calculated by use of equalization signals corresponding to 100,000 channel bits or more.

10. An information recording medium from which reproduction signals are reproduced by use of a PRML (partial response and maximum likelihood) discrimination method, the reproduction signals being evaluated based on an evaluation value obtained by:

detecting matching between discrimination data and a plurality of predetermined bit sequence pairs of different groups;

calculating a bit sequence and corresponding two ideal responses when the matching is detected;

obtaining Euclidean distances between the two ideal responses and equalization signals;

obtaining a difference between the Euclidean distances;

obtaining a mean value and a standard deviation with respect to the difference between the Euclidean distances; and

calculating a quality evaluation value of a reproduction signal based on the mean value, the standard deviation, an appearance probability of the predetermined bit sequence, and a Hamming distance between the predetermined bit sequence pairs,

said information recording medium satisfying a requirement that the evaluation value is not more than 10×10^{-3}.

11. An information recording medium according to claim 10, wherein said quality evaluation signal is used as a first evaluation value, a target signal is calculated based on a predetermined data sequence and a predetermined partial response characteristic, an equalization error representing a difference in reproduction equalization signals is calculated in each clock period, a second evaluation value based on the autocorrelation of the equalization error is used as an evaluation value for evaluating the signal quality, and said first evaluation value and said second evaluation value are used in combination to obtain final

evaluation,

said information recording medium satisfying a requirement that the first evaluation value is not more than 10×10^{-3} and the second evaluation value is not less than 12.

12. A recording information medium according to claim 11, wherein the final evaluation is made based on the first evaluation value, the second evaluation value and a third evaluation value, the third evaluation value being provided by an error correction decoder, which performs error correction with respect to the reproduction signals, and attributable mainly to a medium defect,

said information recording medium satisfying a requirement that the first evaluation value is not more than 10×10^{-3}, the second evaluation value is not less than 12, and the third evaluation value is not more than 280 for 8 ECC consecutive blocks.

13. An information recording medium according to claim 10, wherein said quality evaluation signal is used as a first evaluation value, a target signal is calculated based on a predetermined data sequence and a predetermined partial response characteristic, an equalization error representing a difference in reproduction equalization signals is calculated in each clock period, a second evaluation value based on the autocorrelation of the equalization error is used as an

evaluation value for evaluating the signal quality, and said first evaluation value and said second evaluation value are used in combination to obtain final evaluation,

said information recording medium satisfying a requirement that the second evaluation value is not less than 15.

14. An information recording medium from which reproduction signals are reproduced by use of a PRML (partial response and maximum likelihood) discrimination method, the reproduction signals being evaluated based on an evaluation value obtained by:

detecting matching between discrimination data and a plurality of predetermined bit sequence pairs of different groups;

calculating a bit sequence and corresponding two ideal responses when the matching is detected;

obtaining Euclidean distances between the two ideal responses and equalization signals;

obtaining a difference between the Euclidean distances;

obtaining a mean value and a standard deviation with respect to the difference between the Euclidean distances; and

calculating a quality evaluation value of a reproduction signal based on the mean value, the standard deviation, an appearance probability of the

predetermined bit sequence, and a Hamming distance between the predetermined bit sequence pairs,

said information recording medium satisfying a requirement that the evaluation value is not more than 10×10^{-5}.

15. An information recording medium according to claim 14, wherein said quality evaluation signal is used as a first evaluation value, a target signal is calculated based on a predetermined data sequence and a predetermined partial response characteristic, an equalization error representing a difference in reproduction equalization signals is calculated in each clock period, a second evaluation value based on the autocorrelation of the equalization error is used as an evaluation value for evaluating the signal quality, and said first evaluation value and said second evaluation value are used in combination to obtain final evaluation,

said information recording medium satisfying a requirement that the first evaluation value is not more than 10×10^{-5} and the second evaluation value is not less than 15.

16. A recording information medium according to claim 15, wherein the final evaluation is made based on the first evaluation value, the second evaluation value and a third evaluation value, the third evaluation value being provided by an error correction decoder,

which performs error correction with respect to the reproduction signals, and attributable mainly to a medium defect,

said information recording medium satisfying a requirement that the first evaluation value is not more than 10×10^{-5}, the second evaluation value is not less than 15, and the third evaluation value is not more than 280 for 8 consecutive ECC blocks.